



# **Manchester Urban Ponds Restoration Program**

## **Pond Goals & Project Prioritization Status Report**



**Jen Drociak**

Manchester Conservation Commission

**&**

**Art Grindle**

Program Coordinator

**2005**

# POND PROJECT PRIORITIZATION STATUS - 2005

## Crystal Lake

**Goal(s):** To maintain fishable and swimmable water quality standards

### Water Quality:

- 1) Address beach parking lot runoff/drainage issues.
- 2) Address Corning Rd runoff/drainage issues.

**1994-1999:** The health of Crystal Lake has been the focus of the efforts of the Crystal Lake Preservation Association (CLPA) since their inception in 1994. In 1999, the CLPA was awarded a grant from DES to install a new stormwater treatment system – the StormTreat system. This system now treats runoff from Bodwell Road and adjacent parking areas before it enters the lake. With this installation, one of only three surface water inlets is now being treated.

**2002-2004:** Comprehensive Environmental, Inc (CEI) was contracted through the SEPP to design plans to address items 1 & 2 above. The final design plans were completed and the projects were put out to bid in 2003. These projects included installation of best management practices (BMPs) at the two remaining outfalls that impacted Crystal Lake.

Best management practices (BMPs) were installed at the City beach on Bodwell Road. Prior to this project, stormwater runoff (contaminated with sediment and other constituents) would flow down gradient from the entrance road to the storm drain network and straight into the lake. To prevent this, the sides of the entrance road were stabilized with filter fabric and crushed stone with perforated pipe drainage systems under them. Deep sump catch basins replaced the existing catch basins and the underground stormwater pipe leading from the parking area to the lakeshore was removed to be replaced by a grassed drainage swale. These measures combined have greatly reduced to volume of runoff that reaches the catch basin network under the parking area and cleaned up any runoff that reaches the lake.

The outfall that drains part of Corning Road is directly adjacent to a highly erodable steep slope. This slope contributed sediment that washed down Corning Road and into the drainage system. The slope also results in the necessity for intensive salt/sand treatment during winter months because of the high occurrence of icing on this section of road. These combined factors had formed a nutrient-rich sediment delta in the Lake at the point of the outfall. At this location, a velocity-reducing device was installed in the form of a baffle box. Due to the steep slope of the area between Corning Road and the shoreline, a baffle tank is called for at the top of the drainage line. The two-baffle system will allow sediment to settle before continuing to the outfall. Installation of curbing along the south side of Corning Road will help prevent sediment eroding from the steep hillside from entering the drainage system.

- 3) Address *Phragmites* stand by chemical and mechanical treatments.

**2004:** On September 13<sup>th</sup>, Municipal Pest Management Services applied an herbicide treatment (Glyphosate, trade name *Rodeo*) on the infested areas of Crystal Lake. *Rodeo* is similar to the household herbicide *Roundup* and is comprised of a concentrated salt. *Rodeo* quickly breaks down to its raw constituents (carbon dioxide, nitrogen, phosphorus and water) as soon as it contacts water, making it safe for plant eradication in aquatic situations. The Crystal Lake Preservation Association performed the same type of treatment around the lake in 1997.

Even though the herbicide was only sprayed on *Phragmites* stems, a second treatment may be required in 2005. A 2005 permit application to the N.H. Department of Agriculture is being written. That treatment managed the infestation from spreading for about 5 years. A long-term treatment plan should be developed and implemented with the cooperation of the Crystal Lake Preservation Association, with the goal of complete *Phragmites* eradication. The dead stalks will be cut and burned after ice-in in 2005. This will remove the seed stock from the site and the nutrient-rich decaying plant material from entering and polluting the lake water.



Mike Morrison applies an herbicide treatment on an invasive *Phragmites* stand at Crystal Lake.  
Photo by Art Grindle



An area of Phragmites was also dredged near the parking lot drainage entrance into the Crystal Lake 1) Area of Phragmites in lake before dredging; 2) During dredging; 3) Dewatering Phragmites pile after dredging; 4) Area of Crystal Lake free of Phragmites after dredging. Photos by Manchester EPD.

#### 4) Repair StormTreat System by adjusting headbox baffle wall.

After further investigation of the system, it was determined that there was a blockage between the sediment headbox and the StormTreat system. The City's public works department is currently addressing the situation.

### Outreach/Education:

#### 1) Continue providing educational materials in kiosk at beach.

**2004:** A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These were updated in November of 2003 and were posted during the summer of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

#### 2) Conduct native planting workshop to address intensely-maintained shoreland areas.

#### 3) Provide *Phragmites* education to property owners.

**2004:** This was re-addressed by an abutter mailing during the spring of 2004.

### Recreational:

#### 1) Support project partner efforts to preserve and restore beach house and address parking situation.

### Land Preservation:

#### 1) Support the advocacy of land conservation in areas where there is development pressure.

#### 2) Provide careful consideration of land acquisition within the watershed.

**2001-2004:** CLPA has also been active in attempts to preserve certain tracks of land adjacent to the lake that are threatened by residential development. This area, known as the Filip's Glen subdivision, is the only remaining open space in proximity to the lake. It is important for the long-term health of the lake that this area be developed only in the most environmentally sensitive way possible. The CLPA was able to purchase property proposed for development. The developer has donated the largest wetland portion of the property to the CLPA. This particular portion is the closest to the lake of all the properties in question. A significant amount of the Urban Ponds Restoration Program budget has been allocated for the ultimate purchase and preservation of large portions of the Filip's Glen subdivision property to help preserve the water quality of Crystal Lake.



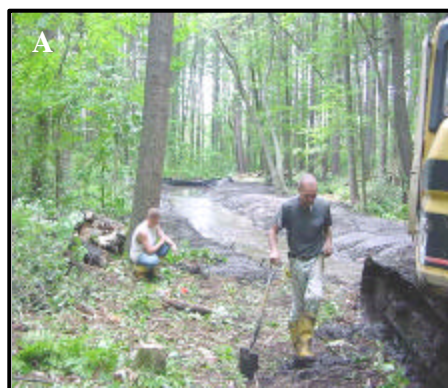
# Dorrs Pond

**Goal(s):** To restore fishable and swimmable water quality standards.

## Water Quality:

- 1) Address tributary 2E runoff/drainage improvements.

**2004:** Comprehensive Environmental Inc. (CEI) was contracted through the SEPP to address item #1 above. Designs were completed and the project was put out to bid in early 2004. The east side of Dorrs Pond is heavily developed with residential and commercial land uses. This area drains into a tributary that has contributed pollution to the pond for many years. During the summer/fall of 2004 the three drain lines that feed this tributary have been retrofitted with settling chambers to reduce sedimentation of the pond. Nutrients such as nitrogen and phosphorus are attached to sediment particles, so by reducing sediment, nutrient loading is also reduced. After the stormwater flow exits the chambers, it enters the tributary, which has been altered to further clean the runoff. Large rip-rap was added to reduce flow velocity. Downstream from the rip-rap, a system of biologs and wetland plantings will allow more runoff polishing and nutrient uptake.



*A) Brook Channeling; B & C) Biologs in Brook Channel. Photos courtesy of Rob Robinson – Manchester EPD.*

- 2) Address tributary DP3 runoff/drainage improvements.
- 3) Perform wetland function study in the north end.
- 4) Perform possible sediment dredging in the north end to lessen nutrient load.
- 5) Address Goldfish Pond drainage by including outlet in regular sampling schedule and working with Hooksett Conservation Commission.
- 6) De-Channelize Ray Brook at outlet of Dorrs Pond

## Outreach/Education:

- 1) Retrofit and provide educational materials in kiosk at Livingston Park.
- 2) Provide fertilizer education through signage at kiosk.
- 3) Address duck feeding through signage in kiosk and on shore.

**2004:** A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These were updated in November of 2003 and were posted during the spring of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

- 4) Address invasive species through signage at boat ramp and kiosk.

**2003:** A sign has been placed at the boat ramp stating that Dorrs Pond is currently free of aquatic exotic plants and instructing boaters to remove all plant fragments from their boats to keep exotics out of the waterbody.

- 5) Address organic debris accumulation at dam through collaboration with Parks & Recreation.

This item is completed annually by the Parks & Recreation Department.

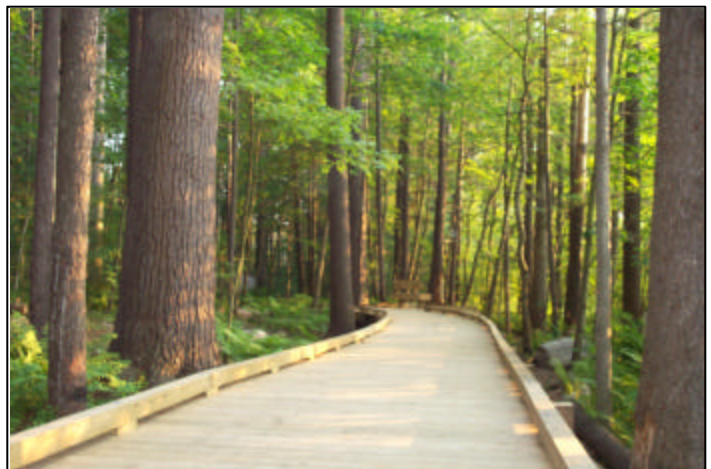
### **Recreational:**

- 1) Work with Parks & Recreation with trail/Parking lot enhancement projects.

Trail improvements were recently completed around the pond. In 2001, the Manchester Parks Recreation and Cemetery Department received a grant from the Land and Water Conservation Fund to carry out a major trail improvement project at Livingston Park. The grant was matched by a private local fund. The improvement plan consisted of trail improvements, handicap accessibility through approximately 50% of the trail network, boardwalk and bridge construction and viewing areas with benches. Bridges were installed over seasonal stream crossings lessening the likelihood of stream channel disturbance and erosion. The park parking lot now served by a runoff treatment system to treat runoff before it exits into Ray Brook. This project was completed in 2004.

### **Land Preservation:**

- 1) Support the advocacy of land conservation in areas where there is development pressure.
- 2) Provide careful consideration of land acquisition within the watershed.
- 3) Secure adjacent parkland through zoning/easements and possible creation of "Town Forest."



*New boardwalk and trails at Dorrs Pond. Photos by Jen Drociak*



# Maxwell Pond

**Goal(s):** To assess the feasibility of dam removal and to conduct a habitat assessment.

## Water Quality:

- 1) Conduct a dam removal feasibility study.
- 2) Address upstream sedimentation.
- 3) Address apartment complex runoff/drainage issues.
- 4) Assess habitat enhancement and support an increase of biodiversity.

**2001-2004:** The City of Manchester (*Lands & Buildings Committee and Mayor & Board of Aldermen*) is faced with making a timely and informed decision about whether to repair and maintain, or remove the dam at Maxwell Pond. The dam is currently in disrepair and no longer fulfills its historical function (ice harvesting in the 1900s).



*Aerial of Maxwell Pond, 2004.  
Photo courtesy of Pete Walker, VHB.*

Maxwell Pond Dam has deteriorated to the point that it needs an estimated \$60,000 in repairs. On September 13, 2002 Manchester received an order to repair or remove the dam from the NH Department of Environmental Services, which oversees dam safety. Maxwell Pond does not fulfill a commercial, water supply, or flood control function. Additionally, many of its recreational and aesthetic benefits were lost due to the transport of sediment from upstream and the growth of vegetation around its edges. In 1954 the pond had a maximum depth of 8 feet; today its maximum depth is just 4 feet. Dredging would be required to return the pond to its previous condition. Preliminary estimates indicate that it would cost approximately \$1,300,000 to dredge the pond. This would be in addition to the \$60,000 to repair the dam, plus ongoing maintenance costs.

Removing the dam would cost an estimated \$50,000. While dam removal would not restore swimming, skating and other uses once provided by the pond, it would offer other recreational and aesthetic benefits instead, such as stream-side trails and views of bedrock cascades. Removing the dam would also relieve the City of any future financial and legal liabilities related to the dam, as well as restore Black Brook to its natural free-flowing condition and improve stream ecology, opening up approximately 6 miles of unimpeded anadromous fish passage. Federal and state grant funding is available for dam removal.

Maxwell Pond was created when a dam was built on Black Brook in 1900. The pond, located on Front Street just south of Dunbarton Road, was reportedly named for A.H. Maxwell, owner of the Manchester Coal & Ice Company during the 1930s and 1940s. The company sold ice year-round from its icehouse next to the pond by keeping it cold with hay bales. Until the late 1950s, Maxwell Pond was also a popular place for swimming, picnicking, and fishing. In the winter, the pond provided a spot for skating, bonfires and hockey games. It was also once considered for a secondary municipal water source for the City of Manchester, but the idea was apparently abandoned sometime in the 1960s. Today the dam is owned by the City and managed by the Manchester Parks and Recreation Department.

To date, members of the Manchester Urban Ponds Restoration Program, Manchester Conservation Commission, Parks & Recreation Department, NH Department of Environmental Services, and Trout Unlimited have held two public informational meetings (*May 22, 2003 and January 20, 2005*) and have attended two Lands & Buildings Committee meetings (*August 10<sup>th</sup> and November 15<sup>th</sup> 2004*) to provide details on the repair or removal of the dam including costs, benefits and funding sources. A question & answer session and public comment period followed both public informational meetings. Next steps include meeting with the Lands & Buildings Committee again for a recommendation to the full Mayor and Board of Alderman.

## Outreach/Education:

- 1) Construct and provide educational materials in kiosk at Blodgett Park.

**2003:** An Eagle-Scout constructed a kiosk at Blodgett Park in May 2003. A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the

waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These were updated in November of 2003 and were posted during the early summer of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

- 2) Examine and address the threat of invasive species.

**2004:** A partnership between the UPRP, National Park Service (NPS), and the New England Wildflower Society (NEWFS) was developed in 2003 to address invasive species management options on Maxwell Pond's southeast side. NEWFS has drafted a brief work-plan for the field season 2005.

### **Recreational:**

- 1) Work with Parks & Recreation to construct a boardwalk and loop-trail around Maxwell Pond. This includes a small bridge over Black Brook.

### **Land Preservation:**

- 1) Secure adjacent parkland through zoning/easements.



1A) Maxwell Pond Dam; 1B) Photo rendering post dam removal; 2A) Maxwell Pond; 2B) Photo rendering post dam removal.  
Photos courtesy of Jim MacCartney, Trout Unlimited.

# McQuesten Pond

**Goal(s):** To secure conservation easements on private property adjacent to the pond.

## Water Quality:

- 1) **Long Term:** Reduce pavement and restore shoreland in adjacent parking lots.
- 2) **Short-Term:** Advocate for on-site stormwater treatment systems.

## Outreach/Education:

- 1) Construct and provide educational materials in kiosk at Wolfe Park.
- 2) Address invasive species through signage at kiosk and mailing to property owners.
- 3) Address duck feeding through signage at kiosk.

**2003:** An Eagle-Scout constructed a kiosk at Wolfe Park in May, 2003. A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These were updated in November of 2003 and were posted during the spring of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

- 4) Address adjacent dumpster & lot runoff through business mailings and site visits.

## Recreational:

- 1) Construct a boardwalk at north end of pond.

## Land Preservation:

- 1) Secure conservation easements on private property abutting pond.

**Ongoing:** Since McQuesten Pond is largely privately owned, City funded conservation projects are not feasible at this time on most of the pond. The focus remains on obtaining easements or ownership from key property owners of the wetland and open water areas. In the mean time, conservation efforts will continue at the city-owned Wolfe Park side of the pond.

- 2) Investigate and consider potential for purchasing McQuesten Pond from the abutting landowners



*Marty Gavin loads a dump truck with debris from a cleanup  
at McQuesten Pond.  
Photo by Art Grindle*



# Nutts Pond

**Goal(s):** To improve sport fishing and non-motorized/recreational boating opportunities. To improve water quality.

## Water Quality:

- 1) Address urban runoff at four outfalls by completing a drainage study.
- 2) Investigate opportunities for NPS reduction in upper watershed areas.
- 3) Investigate opportunities to stabilize shoreline with native plantings.

**2002-2004:** During the winter of 2002 and 2003, Comprehensive Environmental Inc (CEI) conducted a nutrient budget study for the Nutts Pond watershed to help identify the worst pollution sources. The watershed was separated into five subwatersheds and nutrient inputs were calculated according to land use types in each subwatershed. East Inlet subwatershed, the largest subwatershed area (more the 13 million square feet) was found to be the largest contributor of nutrients to the pond (58%). This subwatershed contains extensive athletic fields, large heavily used paved lots, extensive residential neighborhoods, and several strip malls. This area could be the focus for the first BMP installations at Nutts Pond. Recommendations for possible treatment measures were included in a memorandum report by CEI.

Currently, CEI is working on designs for BMP installation in the Precourt Park area. Since the Parks & Recreation Department is planning on improving Precourt Park in 2005, it seemed timely to concurrently address water quality improvements on the pond's north end. Incorporating BMPs into the original park facelift design will save unnecessary duplication of destruction and construction. The BMP design will attempt to divide stormwater volume and infiltrate as much flow as the site allows.

CEI is also working on BMP designs for the north and south inlets. Based on the large drainage areas and anticipated flows, the most cost-effective method to prevent pond sedimentation seems to be to build forebay structures around the inlet structures. This will allow for containment of the sediment to a specific area, which can be cleaned periodically. The accumulated sediment deltas at the north and south inlets will be dredged to remove the nutrient rich material. These projects are scheduled to be constructed in 2005.

## Outreach/Education:

- 1) Retrofit and provide educational materials in kiosk at Precourt Park.

**2003 - 2004:** An Eagle-Scout retrofitted the kiosk at Precourt Park with corkboard during May, 2003. A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These fact-sheets were updated in November of 2003 and were posted during the spring of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

- 2) Provide outreach/education to area businesses through mailings and on-site pollution prevention assessments.

**2002-2003:** In 2002, the UPRP also created a pollution prevention business survey for facilities within the Nutts Pond watershed. From July through December 2003, 37 (out of 84) businesses in the Nutts Pond watershed were visited. These sites were chosen based on their proximity to Tannery Brook and Nutts Pond.

A few weeks prior to the visits, the businesses were mailed a letter explaining the project. During the visits, the store manager or facilities maintenance person was interviewed. Most businesses visited assessed on general information (whether they were aware of their proximity to Nutts Pond), solid waste/dumpster maintenance, floor drains, stormwater management, use oil, and use and/or storage of any other hazardous materials.

Most of the businesses were retail establishments that did not produce much solid waste and did not deal with any hazardous product storage or waste(s). All of the businesses surveyed were written a thank-you/follow-up letter, given suggestions for areas which needed improvement, and were also given an UPRP sticker for their window.

- 3) Address dumpster debris at Precourt Park through partnership with Parks & Recreation and Highway Department.

- 4) Address invasive species through signage at kiosk and at boat ramp.

**2001:** During a pond survey in 2001, staff from the Urban Ponds Restoration Program identified an exotic aquatic weed, Brazilian Elodea (*Egeria densa*), growing along the shoreline of Nutts Pond. This was the first confirmed occurrence of this plant in New England waters. *Egeria densa* is an extremely invasive aquatic plant (similar to variable milfoil) that rapidly outcompetes native submerged aquatic vegetation and radically alters aquatic habitat.

**2003:** With funding from the NH Department of Environmental Services, Nutts Pond was treated by Lycott Environmental with an aquatic herbicide in June 2003. Signs were also posted at the boat launch.

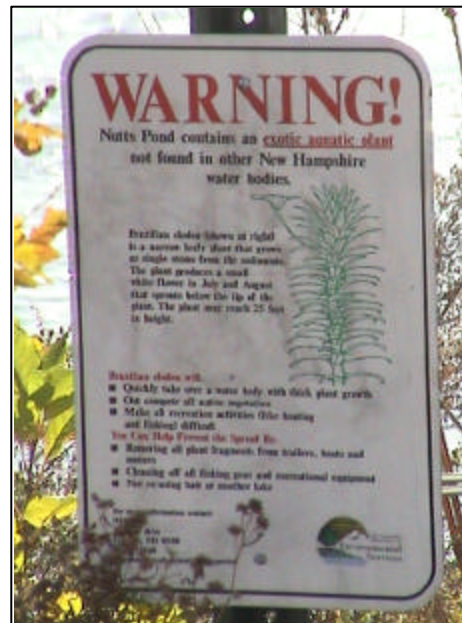
**2004:** During the summer of 2004, only 2 individual *Egeria densa* plants were detected in, and removed from, Nutts Pond. Thus, the treatment seems to be a success! Ken Warren, Aquatic biologist responsible for aquatic weed control at NHDES stated that "The early detection of this invasive plant by the Manchester Urban Ponds staff allowed for a successful herbicide treatment of the pond". Warren further stated that "Left undetected this troublesome South American weed would have infested other nearby urban ponds as well as other waterbodies within the state." Staff from UPRP will continue to monitor Nutts Pond to ensure that this invasive weed does not make a comeback.

### Recreational:

- 1) Partner with Queen City Trails Alliance/Manchester Rails-To-Trails to enhance pond circuit trail.
- 2) Investigate use of and potentially improve boat-launch.



*Lycott Lake and Pond Management applies an herbicide on Nutts Pond to control the invasive aquatic plant Brazilian waterweed (*Egeria densa*). Photos by Jen Drociak*



*Brazilian Waterweed Sign at Nutts Pond.  
Photo by Art Grindle*

# Pine Island Pond

**Goal(s):** To maintain fishable and swimmable water quality standards and to improve fish habitat.

## Water Quality:

- 1) Stabilize Cohas Brook streambank areas.
- 2) Address sedimentation at Cohas Brook where it enters Pine Island Pond.

**2004:** This project idea has been included on a short list of projects proposed for the remaining SEPP funds. If budgeting allows, this project will be pursued in 2005.



*Photo by Art Grindle*

## Outreach/Education:

- 1) Retrofit and provide educational materials in kiosk at Pine Island Park.

**2003:** An Eagle-Scout retrofitted the kiosk at Pine Island Park with corkboard during May, 2003. A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These fact-sheets were updated in November of 2003 and were posted during the spring of 2004. An additional series of pond-specific fact-sheets were also created in 2004 and will be posted at the kiosk in 2005.

- 2) Address accelerated plant growth through fertilizer education to property owners.

**2003-2004:** This has been addressed by educational direct mailings to pond abutters in 2003 and 2004.

- 3) Address invasive species at Cohas Brook through volunteer maintenance efforts.

**2004:** Volunteers have been monitoring water quality and hope to form a "Weed Watcher" effort in order to stay abreast of invasive aquatic species at Pine Island Pond.

- 4) Support other entities to address boat wake issues.

## Recreational:

- 1) Assess feasibility of fish ladder at dam with NHFG.

## Other:

- 1) Form Pond Association & Develop Watershed Management Plan.

**2004:** The Pine Island Pond Environmental Society (PIPES) was formed in September 2004 as a means for area residents to help preserve the quality of life in their neighborhood. The group's purpose is to foster the protection and preservation of Pine Island Pond. The PIPES Political Action Committee currently has 18 members and continues to grow. PIPES has been motivated by a number of issues including declining water quality of Pine Island Pond, impacts from unscheduled draw-downs, land development, invasive aquatic plants, and many others. The unscheduled draw-down that drained the pond last June energized pond residents to take action. Certain members of PIPES have been working for pond conservation for quite some time conducting water quality monitoring and historical research. Volunteers at Pine Island Pond have been involved with the NH Volunteer Lakes Assessment Program (a program coordinated by NH DES) for five years. For this program, volunteers assist staff from the Manchester Urban Ponds Restoration Program in collecting monthly pond samples for water quality tracking.



# Stevens Pond

**Goal(s):** To improve water quality through a partnership with the New Hampshire Department of Transportation to address highway runoff.

## Water Quality:

- 1) Address and remedy I-93 runoff issues.

**2001-2004:** Since 2001, several agencies have been working on a solution to the highway runoff issue at Stevens Pond. The NH Department of Transportation has expressed willingness to work with DES and the UPRP to treat the highway runoff that is drastically affecting the water quality of Stevens Pond. Proposed solutions include a closed drainage system to divert stormwater to where adequate treatment can be attained, or a berm diversion system to separate the stormwater from Stevens Pond. Discussions with NH DOT are still ongoing.



*Fishermen on Stevens Pond. Photo by Art Grindle*

- 2) Address headwater erosion at EJ Roy Drive and other developed areas.

## Outreach/Education:

- 1) Construct and provide educational materials in kiosk at boat launch.
- 2) Address invasive species with proper signage at kiosk and boat launch.

**2003:** An Eagle-Scout constructed a kiosk at the Stevens Pond boat ramp during May, 2003. A series of color, laminated fact-sheets was created in 2002 and posted in the kiosk during the summer of 2003. These included a map of the waterbody/watershed, fact-sheets on the history of the waterbody, non-point source pollution issues, common exotic plants, and common fish. These fact-sheets were updated in November of 2003 and were posted during the spring of 2004.

**2003:** A sign has been placed at the boat ramp stating that Stevens Pond is currently free of aquatic exotic plants and instructing boaters to remove all plant fragments from their boats to keep exotics out of the waterbody.

## Recreational:

- 1) Improve boat-launch.
- 2) Work with Parks & Recreational Department to create a wetland boardwalk.
- 3) Improve adjacent trails.

**2004:** These project ideas have been included on a short list of projects proposed for the remaining SEPP funds. If budgeting allows, these projects will be pursued in 2005.

## Land Preservation:

- 1) Secure adjacent parkland through zoning/easements.